

CLAIMS

What is claimed is:

1. A process for the manufacture of 1,1,1,3,3-pentafluoropropane and 1,1,1,3,3,3-hexafluoropropane, comprising:

- 5 (a) reacting HF and at least one halopropene of the formula  $CX_3CCl=CClX$ , wherein each X is independently selected from the group consisting of F and Cl, to produce a product comprising  $CF_3CCl=CF_2$  and  $CF_3CHClCF_3$ , wherein said  $CF_3CCl=CF_2$  and  $CF_3CHClCF_3$  are  
10 produced in the presence of a fluorination catalyst comprising at least one composition selected from the group consisting of (i) compositions comprising  $ZnCr_2O_4$  and crystalline  $\alpha$ -chromium oxide, (ii) compositions comprising a zinc halide and  $\alpha$ -chromium oxide and (iii)  
15 compositions of (i) or (ii) which have been treated with a fluorinating agent;
- (b) reacting  $CF_3CCl=CF_2$  and  $CF_3CHClCF_3$  produced in (a) with hydrogen to produce a product comprising  $CF_3CH_2CHF_2$  and  $CF_3CH_2CF_3$ ; and  
20 (c) recovering  $CF_3CH_2CHF_2$  and  $CF_3CH_2CF_3$  from the product produced in (b).

2. The process of Claim 1 wherein in (a) the catalyst is selected from the group consisting of (i) compositions comprising  $ZnCr_2O_4$  and crystalline  $\alpha$ -chromium oxide and (iii) compositions of (i) which have been  
25 treated with a fluorinating agent.

3. The process of Claim 2 wherein the amount of zinc relative to the total of chromium and zinc in the catalyst composition is from about 1 atom % to about 25 atom %.

4. The process of Claim 2 wherein the catalyst is selected from  
30 the group consisting of (i) compositions comprising  $ZnCr_2O_4$  and crystalline  $\alpha$ -chromium oxide wherein the  $ZnCr_2O_4$  contains between about 10 atom percent and 67 atom percent of the chromium in the composition and at least about 70 atom percent of the zinc in the composition, and wherein at least about 90 atom percent of the chromium  
35 present as chromium oxide in the composition is present as  $ZnCr_2O_4$  or crystalline  $\alpha$ -chromium oxide and (iii) compositions of (i) which have been treated with a fluorinating agent.

5. The process of Claim 1 wherein in (a) the catalyst is selected from the group consisting of (ii) compositions comprising a zinc halide and  $\alpha$ -chromium oxide and (iii) compositions of (ii) which have been treated with a fluorinating agent.
- 5 6. The process of Claim 5 wherein the amount of zinc relative to the total of chromium and zinc in the catalyst composition is from about 0.1 atom % to about 25 atom %.
7. The process of Claim 5 wherein the catalyst is selected from the group consisting of (ii) compositions wherein a zinc halide is supported on a support comprising  $\alpha$ -chromium oxide and (iii) compositions of (ii) which have been treated with a fluorinating agent; and wherein the amount of zinc relative to the total of chromium and zinc in the catalyst composition is from about 2 atom % to about 10 atom %.
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